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The present study attempted to determine the optimal difficulty level of some occupational problems for students with varying interests and ability levels. Some 288 high school boys were presented with simulated vocational problems in sales, medical laboratory technology, and x-ray technology. The criterion for a successful performance was set at three levels of difficulty. Each subject was assigned at random a problem in one occupation and at one of the three levels of difficulty. Subject variables were grade level, grade point average, and initial occupational interest as measured on the Holland Vocational Preference Inventory. Criterion measures of three types were taken: expressed interest in the occupation, scores on an information test covering the occupation simulated, and incidents of information seeking during the week following treatments. Analysis of variance was used to test the main effects and all interactions. Difficulty level was not found to produce differences on the measures used, but did significantly interact with initial vocational interest pattern. The simulated problems in each occupation did generate interest and exploration in that occupation. Most students reacted favorably to the experience. (Author)

SIMULATED OCCUPATIONAL PROBLEMS

IN ENCOURAGING CAREER EXPLORATION

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Our present day culture deprives young people of all social classes of relevant prevocational experiences. The movement of families away from the working city to the suburban bedroom community has put youth out of touch with the world of work. Many of the jobs being created by advancing technology are performed behind-the-scenes and are not readily visible to youth. Technical advances have made the physical and obvious elements in many occupations less important than the mental and less easily observed components. Even if youths have opportunities to observe people at work, they often see only the superficial aspects of the job and get no real feel for the nature of the problems dealt with in the occupation. The increasing educational requirements for many kinds of employment have also presented a barrier to young people wishing to explore vocations.

A major problem facing school counselors is how to help young people develop vocational or educational goals when the knowledge and experiences of these youths are too limited to provide a basis for evaluating the alternatives. Many youths have no occupational goals, and for those who do these goals are generally selected from a narrow range of the possible occupations. How can these young people be helped to explore the wide range of occupational alternatives?

While typical occupational information available to students in school provides important facts about wages, hours, training and opportunities, these facts themselves lack the appeal necessary to motivate such exploration.

More than 20 years ago H. D. Kitson wrote that "interest in a vocation can come only through experience and most youths have not had experience conducive to the development of interests in specific occupations." He suggested that "one duty of the vocational counselor is to help the individual <u>become interested</u> in occupations." Thus far, however, little is known about ways of deliberately stimulating vocational interests.

Vocational interest research has centered largely on discovering personal and environmental correlates of vocational choice. There has been little experimental research to provide counselors with effective ways to generate vocational interests or to stimulate vocational exploration.

In vocational counseling, interests are generally considered as traits to be assessed and used to narrow the occupational alternatives to be considered. That existing interests may be based on superficial or insufficient information or experience is generally not considered. Even when occasional opportunities are made available to students to read about occupations and talk with or observe employed persons at their work, the young person still does not discover what it feels like to deal with and solve the problems of a particular occupation. All young people need to have some method of testing their own reactions to the tasks required of them by various occupations.

Actual job experience at a number of occupations would be ideal; unfortunately, providing such job experience would be prohibitively costly in both time and money. Simulating such job experiences, however, could be done at much less expense. The questions to be answered are can simulated occupational experiences generate interests and stimulate exploration and if so, how might these simulations be used most effectively.

Answers to these questions have been sought in a series of research projects initiated and directed by John Krumboltz at Stanford University over the past three years. Two of the five major studies to come out of these projects will be reported here.

The first of these two studies tested the hypothesis that high school students actively engaged in solving problems which simulated those typically encountered in an occupation would demonstrate more interest than would students

who are exposed to occupational information in the same occupation.

Experimental materials in medical laboratory technology, x-ray technology, and sales were prepared. Problems which were representative of those actually encountered on the job were selected and presented in booklet form in a realistic though simplified manner. The sales problems dealt with learning to identify a customer's interests and gearing the sales presentation to those interests. The laboratory technologist booklet presented photomicrographs of blood samples for the student to make a differential white cell count to help determine whether or not a patient had appendicitis. The x-ray booklet presented a number of x-ray films for the student to locate flaws and identify probable causes. Each booklet briefly introduced the occupation, asked the student to imagine that he was employed in the particular occupation, presented the problems for solution, provided information necessary for solution, and gave students an opportunity to learn whether or not their solutions were correct and whether or not they correctly solved enough problems to have their performance on the simulated task labeled successful. The material was presented at a difficulty level which assured that at least 75 percent of the target population would be successful.

Booklets similar in outward appearance presenting occupational information in each of the three occupations were prepared as control treatment materials. The control materials asked students to respond to some question about their interests and vocationally related experiences to control for the effect of just making written responses to the material.

The subject pool consisted of 561 high school students making up the entire tenth grade class of the two high schools used in this study. Both high schools were located in the San Francisco Bay area -- one serving an upper middle class

suburban community and the other a lower to lower middle class district in an agricultural-industrial fringe of an expanding metropolitan complex.

The booklets were randomly distributed to students during their regular social studies classes. Each subject received one booklet, experimental or control, on one of the three occupations. Subjects were told that the materials were being developed and it was necessary to try them out with high school students. The booklets contained all necessary directions, and subjects were asked to read and do as directed. One class period was given to complete the booklets. This 50 minute period working with the simulated problems or with the control materials constituted the entire treatment.

The variable of chief concern was the treatment variable -- would the simulated problems produce more interest than the occupational information? We also looked at sex, school, and occupation dealt with in the booklet as variables in an analysis of variance design.

How was interest measured? It was our concern that significant behavior be measured. We asked ourselves what kinds of behavior change could we hope for if an interest were generated? We agreed that if the materials generated an occupational interest, subjects would 1) recognize this interest and indicate it if asked, 2) respond positively when asked about their reaction to working with the booklets, and 3) seek additional vocational information on their own.

One week following the treatments, students were asked to rate their interests in 15 occupations on a five point scale. The three occupations of concern in this study were included in the list of occupations. Significantly more interest was shown in the occupation encountered in the booklet for those who worked on the simulated problems than for those who worked with the occupational information.

One week following the treatments a reaction sheet asking students to indicate their reaction to working with the materials was administered. The problem solving treatment produced more positive responses on seven of the eight items on this instrument but only three of these differences reached statistical significance. Those who had worked on the simulated problems expressed more interest in working on similar booklets, indicated having more knowledge of what it felt like to work at a particular occupation, and indicated more knowledge of what would be expected of a person on the job.

A questionnaire was distributed to all subjects asking them to report various kinds of vocational exploration they engaged in dudring the week following the treatment session. Although in 10 of the 12 kinds of information seeking surveyed more positive responses came from the problem solving group than from the occupational information group the differences were not significant.

An attempt was made to collect more objective measures of vocational information-seeking. Counselors were adked to keep a record of students contacting them with questions relating to vocations during the week following the administration of the booklets. Only seven contacts were reported, all from the middle class school and equally distributed among treatments.

Librarians at each school were asked to keep a special record of students requesting vocational materials during the week following the experimental treatments. No requests were recorded; however, many materials were available which could have been used by students without a request of the librarians.

Post cards addressed to the project at Stanford on which subjects could request occupational information by filling out and mailing were distributed to students as they left the treatment session. For subjects from the school serving

the lower socio-economic community, the simulated problem booklets produced more post card requests than did the occupational information booklets. This difference did not occur at the other school. The post card response from girls was significantly higher than from boys.

This study demonstrated that simulated occupational problems can generate occupational interest and that students enjoy working with these materials. A second study dealt with the question of how the materials might best be presented.

In the study reported above criterion scores for a successful performance were set so that at least 75 percent of the target population would achieve success. What effect does the level of this criterion score have? Will some students be more motivated by working under conditions in which success is difficult to achieve while others respond best when the criteria are lower and success is more easily achieved? The effects of various criterion levels for success on subjects of various ability levels and with different initial occupational interests were investigated in this second study.

The simulated problem materials in the three occupations used in the previous experiment were modified so that each could be presented with the criterion score for a successful performance at three different levels. In pilot studies the criterion levels were determined for each booklet. The easy presentation placed the criteria for success at a point which was achieved or exceeded by 90 percent of the pilot group. The moderately difficult presentation allowed 50 percent to succeed, and the difficult presentation permitted only 10 percent of the pilot group to succeed.

Two hundred eighty-eight boys, randomly selected from the 9th and 11th grades of a high school serving a lower middle class community, were divided by grade in school and then into three ability groups based on grade point average

in such a manner that equal numbers were in each subgroup. Each subject received at random a booklet simulating problems in one occupation presented at one of the three levels of difficulty. A control group was also established to attempt a partial replication of the first study.

The procedures of administration were similar to that in the previous experiment. The measures were modified. Again the question was asked -- what outcomes would be desired if the treatment is effective and interest is generated? The answers agreed upon for this study were that subjects who are interested 1) will recognize this interest and will indicate it when asked, 2) will seek information about the occupation if given the opportunity, and 3) will learn and remember more about the occupation if the information is made available.

As in the previous study, a self-rated interest in the occupation experienced in the booklet was obtained one week following administration of the booklets. To increase the validity of measuring information seeking, direct measures of responses to standard opportunities to seek information were taken rather than self-reports of such vocational exploration. Five opportunities to obtain further occupational information were presented to all subjects during the week following the experience with the simulated problems. Each subject was given the following:

1. A post card addressed to the project on which he could request occupational information.
2. A form on which he could request an interview with his counselor.
3. An opportunity to sign up to work on similar occupational booklets.
4. An opportunity to ask questions which would be answered by a special vocational counselor who would visit the class in a week.
5. An opportunity to request the use of occupational materials which were on display in the library.

Positive responses to each of these standard opportunities to seek information left a written record which was collected as a measure of information seeking and an indication of interest.

Six days following the administration of the problem booklets, each subject was given occupational monographs on the three occupations dealt with in this study. The day following the receipt of this information, a test was given to each subject covering the information in the monograph which corresponded with the occupation he encountered in the booklet during the treatment session. Standard scores on these tests were used as an indication of interest.

Difficulty as manipulated in this study was not found to be a significant main effect. Difficulty level was manipulated by varying the criterion scores rather than varying the difficulty of the problems presented. Perhaps the difficulty encountered with each problem and the satisfaction with its solution was more important than the achievement of a total score and comparing that total with a criterion.

When subjects were grouped according to their highest score on the Holland Vocational Preference Inventory which was administered to all subjects prior to the experiment, difficulty level did interact significantly with initial occupational interest on one measure. Difficult booklets produced higher information test scores for those subjects with intellectual and artistic interests; moderately difficult booklets generated higher scores for those with realistic and social interests, and the easy booklets resulted in higher scores for subjects with conventional or enterprising interests.

Control materials of a different kind were used in this experiment. Rather than occupational information on each of the three occupations a general career planning booklet was used. This booklet stressed the importance of career

planning and indicated how occupations might be explored. This was a general approach to motivating career exploration rather than motivating exploration through specific occupations.

As might be expected when the experimental and control treatments were compared on measures of interest in the specific occupations encountered in the experimental booklets, those in the experimental group indicated more interest than those in the control group both in self-report of interest and in the kinds of information requested on the post cards. On measures of occupational information seeking which were not necessarily related to particular occupations, the booklets simulating problems in specific occupations were as effective as the career planning booklet. In fact, the scores generally favored the simulated problem booklets over the general career planning booklet although the differences were not statistically significant.

These two experiments taken together seem to indicate that vocational interests can be generated using simulated occupational problems and that the use of specific occupational problems not only is effective in producing interests in specific occupations but also is as effective in producing vocational exploration as a more conventional general approach to career planning motivation.

There is voluminous research supporting the notion of the stability of vocational interests. Generally these investigations have been reliability studies and may reflect the stability of the measuring instruments rather than stability of occupational interests. Research on the development of vocational choice and vocational interests have been descriptive. That interests normally develop through certain stages occuring at certain ages and that they remain relatively stable throughout maturity, even if true, do not rule out the possibility that a deliberate attempt to develop new vocational interests at any age level might

not succeed.

The many vocational alternatives offered by the world of work are potential opportunities. These opportunities are actual only when young people see them as possible alternatives and take them into account in making educational and occupational decisions.

The research presented here suggests that vocational interests at least at the high school level are amenable to change. The goal would not be to recruit students to any occupation but to spark an interest in some unexplored vocational areas and thus to increase the alternatives from which the individual can make his own occupational choices.